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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/590,716

04/26/2007

Alan Massey

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EXAMINER

KREINER, MICHAEL B

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,716	<b>Applicant(s)</b> MASSEY ET AL.	
	<b>Examiner</b> Michael Kreiner	<b>Art Unit</b> 3644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/25/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification***

The disclosure is objected to because of the following informalities: p. 3 l. 1-4 "the air-separation device is operated to provide a high flow rate of nitrogen-enriched air in which the concentration of nitrogen is relatively low, compared to that in the nitrogen-enriched air" is unclear because a comparison is made between nitrogen-enriched air and nitrogen-enriched air.

Appropriate correction is required.

### ***Claim Objections***

Claim 1 is objected to because of the following informalities: line 6 "to-supply" should be "to supply". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The term "relatively high concentration of nitrogen" in claims 3 and 8 is a relative term which renders the claim indefinite. The term "relatively high concentration of nitrogen" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

The term "relatively low mass flow rate" in claims 3 and 8 is a relative term which renders the claim indefinite. The term " low mass flow rate " is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

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The term "relatively high mass flow rate" in claim 8 is a relative term which renders the claim indefinite. The term "relatively high mass flow rate" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 2 recites the limitation "said air separation device" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what pressure difference and design threshold are being claimed. Is the pressure difference zero, resulting from a vent to ambient air? Is the mass of gas needed therefore zero, since there's no pressure difference to maintain? What is the design threshold? Is there any specific design threshold mentioned in the specification?

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 6-10 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 6,547,188 to Schmutz *et al.* ("Schmutz").

Regarding claim 1, Schmutz teaches an aircraft fuel tank system comprising: at least one aircraft fuel tank 12; an air separation means 4 for producing nitrogen-enriched air, and control

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means 18 operable to control said air separation means to supply nitrogen- enriched air into said at least one aircraft fuel tank during cruise conditions and to supply nitrogen-enriched air at a higher flow rate during descent (col. 4 *l.* 55-57), whereby substantially the whole of the mass of gas required to maintain the pressure difference across the walls of the fuel tank below a design threshold is provided by said air separation means (col. 2 *l.* 4-12).

Regarding claim 2, Schmutz teaches that said control means controls the air separation means such that the whole of the mass of gas required to maintain said pressure difference is provided by said air separation device (col. 3 *l.* 64 to col. 4 *l.* 4, col. 4 *l.* 47-49).

Regarding claim 3, Schmutz teaches that said air separation means in use provides nitrogen-enriched air having a relatively high concentration of nitrogen at relatively low mass flow rates, with the concentration of nitrogen being lower at higher mass flow rates (Abstract).

Regarding claims 4, 9, and 10, Schmutz teaches means for distributing the nitrogen-enriched air at a number of spaced locations in said at least one aircraft fuel tank, thereby in use to reduce variations in concentration of nitrogen within said tank (conduit 10 provides the nitrogen-enriched air into the ullage of the fuel tank, where it is distributed evenly throughout spaced locations in the ullage of the tank, col. 4 *l.* 5-8).

Regarding claims 6 and 7, Schmutz teaches aircraft fuel tank system comprising: at least one aircraft fuel tank 12; means for providing nitrogen-enriched air 4 for delivery into said at least one tank, and means for distributing 10 said nitrogen-enriched air at a number of spaced locations within said at least one tank, wherein said substantially the entire amount of nitrogen-enriched air is drawn from said providing means (col. 4 *l.* 5-8).

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Regarding claim 8, Schmutz teaches a method of inerting at least one aircraft fuel tank which comprises operating an air separation device during cruise conditions to deliver nitrogen-enriched air with a relatively high concentration of nitrogen at a relatively low mass flow rate into said aircraft fuel tank, and operating said air separation device during descent conditions to deliver nitrogen-enriched air with a lower concentration of nitrogen and at a relatively high mass flow rate (Abstract), whereby the air-separation device provides substantially the whole of the mass of gas required to maintain the pressure difference across the walls of the or each fuel tank below a design threshold (col. 3 l. 64 to col. 4 l. 8).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmutz as applied to claims 1-4 above, in view of Applicant's admitted prior art.

Schmutz teaches that the air separation means includes parallel membranes (col. 3 l. 14-20). Schmutz fails to teach that the membranes are of a hollow fiber type. Applicant admits that it is known to separate air to make nitrogen enriched air using hollow fiber membranes (Applicant's Specification, p. 1 l. 14-18). It would have been obvious to use hollow fiber membranes because they are a proven technology that efficiently creates nitrogen-enriched air.

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***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ekiner et al. (U.S. Pat. No. 5,820,659).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kreiner whose telephone number is (571)270-5379. The examiner can normally be reached on Monday-Friday 9am-5:00pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mansen can be reached on (571)272-6608. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael R Mansen/  
Supervisory Patent Examiner, Art Unit 3644

/M. K./  
Examiner, Art Unit 3644